

Conservation of Diamondback Terrapins in the Southeastern United States



Michael E. Dorcas and J. Whitfield Gibbons

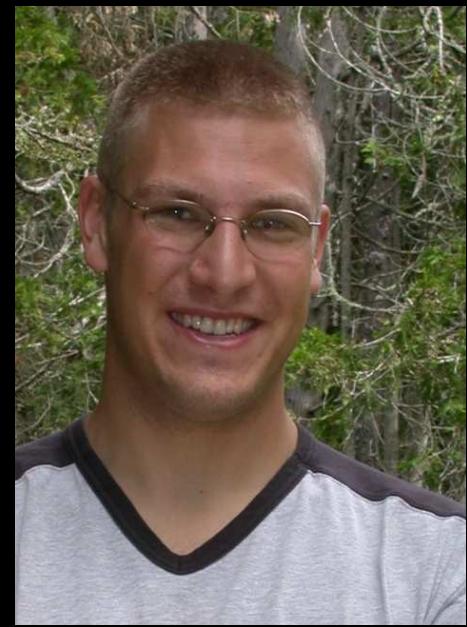
Acknowledgments: Judy Greene, Steve Price, Meg Hoyle, Frank Schwartz, Marilyn Blizzard, Resort Quest (Bill Daniel), Sophia McAllister, SREL and Davidson students/technicians, National Science Foundation

Photos: Cris Hagen, Tom Luhring, JD Willson, Andrew Grosse





Whit Gibbons



John D. Willson



Shannon Pittman



Leigh Anne Harden



Kristen Cecala



Charleston
Harbor

Kiawah Island

Terrapin Studies at Kiawah Island, S.C.

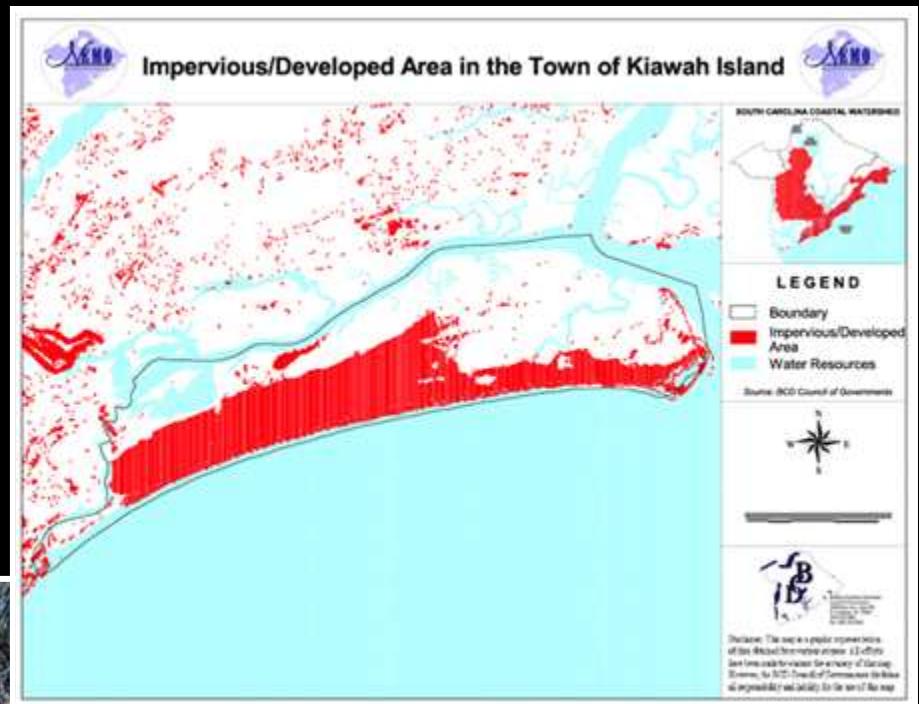


Sampling over a
25-year period
(1983 - Present)



Kiawah Island

Rapidly developing region



Terrapin Studies at Kiawah Island, S.C.

> 1450 individual terrapins marked

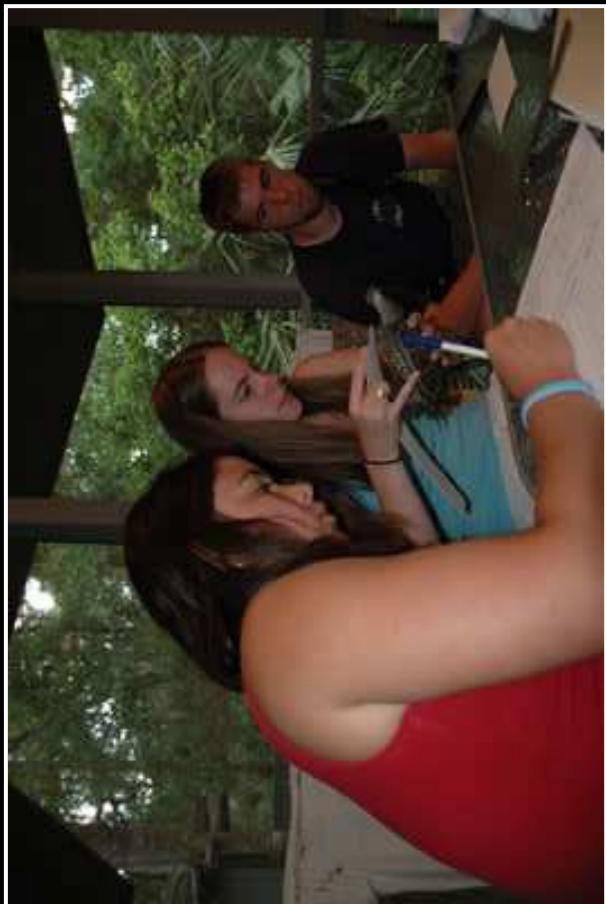
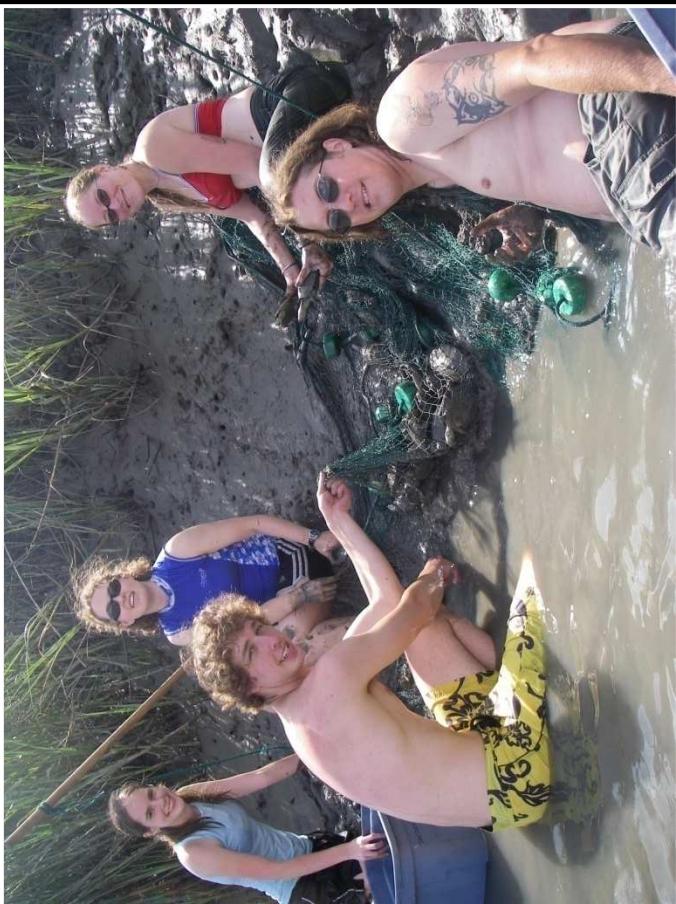


> 2800 captures/
recaptures

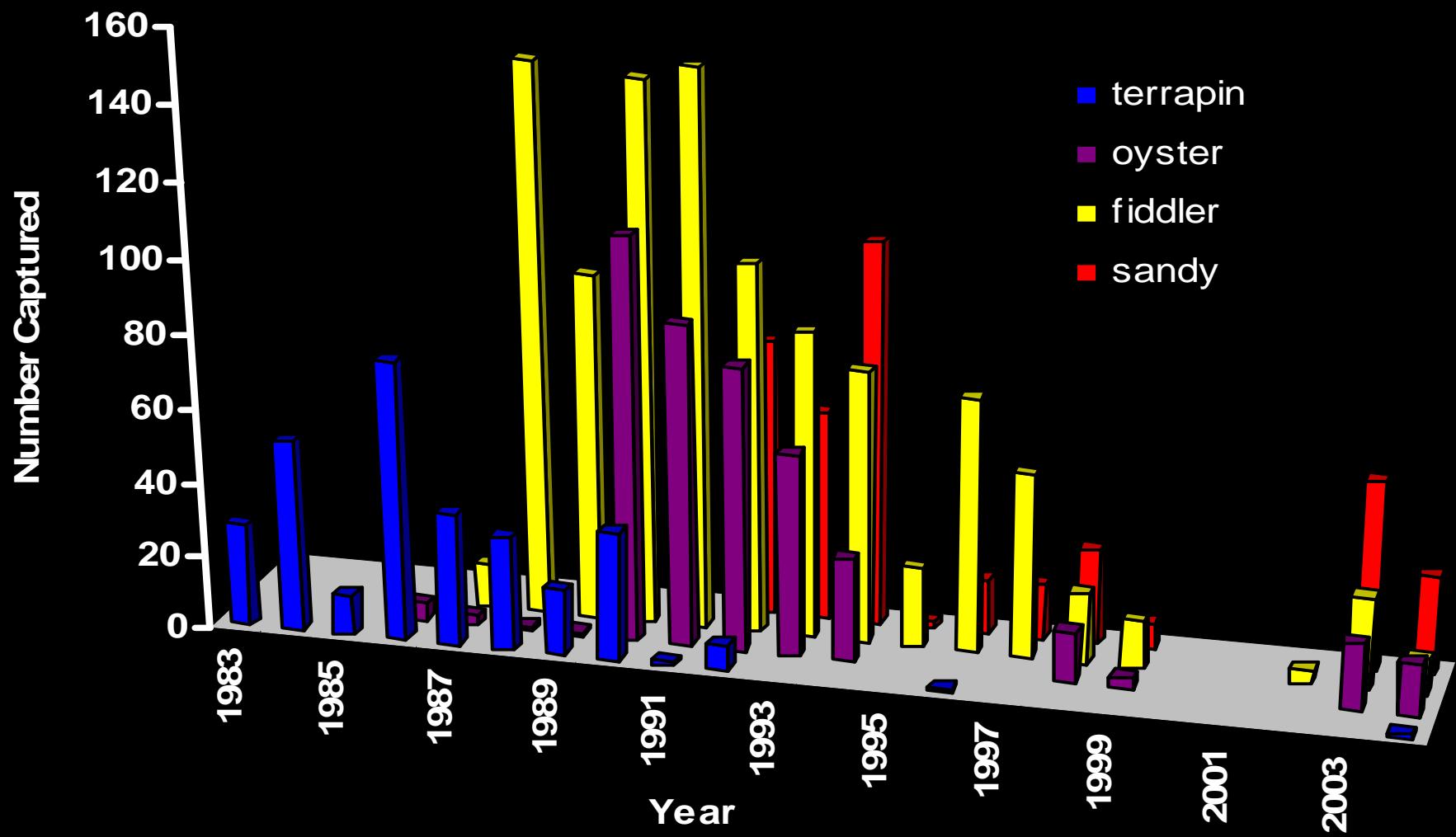


Kiawah River and Associated Tidal Creeks

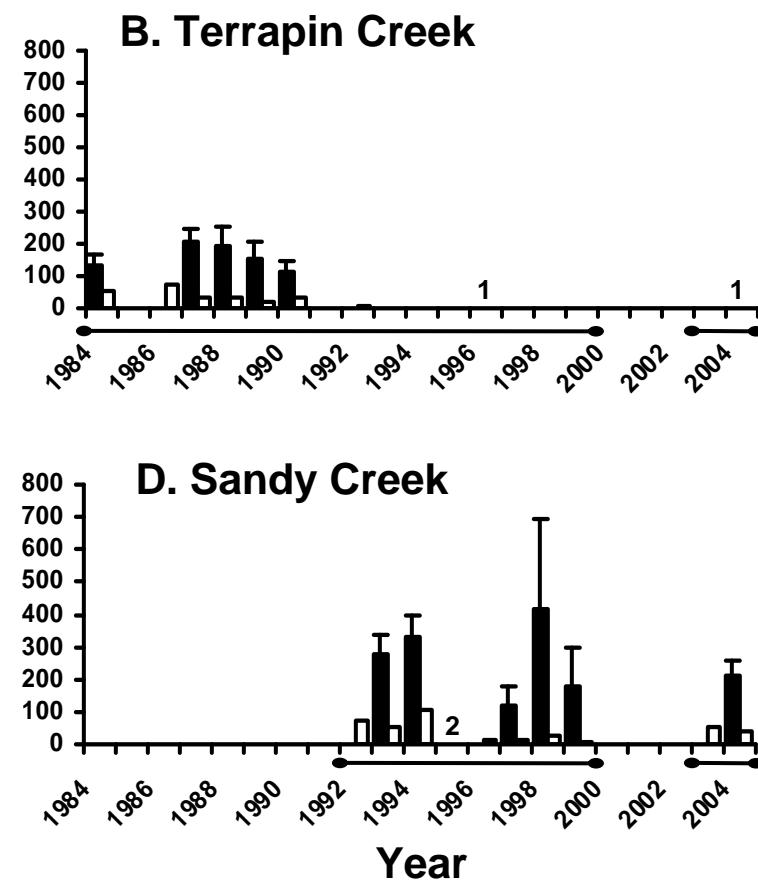
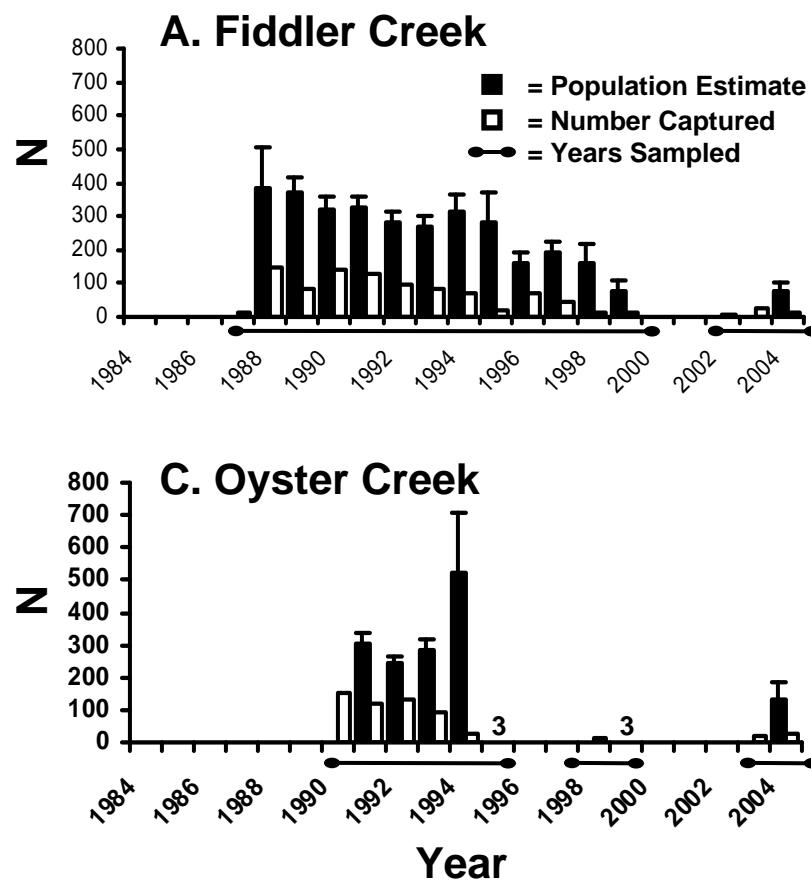




Number of Terrapins Captured in Creeks Over Time



Population Estimates



State First Lady Recipes

MARYLAND

By MRS. J. MILLARD TAWES
Wife of Gov. Tawes

Terrapin Soup

- | | |
|--|--------------------------------|
| 3 terrapins (or, 2 cans of
terrapin meat) | Pinch of pepper |
| 1 stick butter | 6 eggs, hard boiled |
| 1 tablespoon flour | $\frac{1}{2}$ pint heavy cream |
| 1 pint milk | Sherry wine (optional) |
| | Pinch salt |

Terrapins are North American turtles commonly found in the salt water marshes of Maryland. Boil terrapins (5 to 7 inches long) and pick out meat, or use canned meat. Melt butter in good size saucepan. Remove from fire, add heaping tablespoon flour, blend, add milk, salt and pepper to taste. Hard boil six eggs, chop up whites, add to milk, flour and butter mixture. Add terrapin meat. Mash yolks of eggs and add. Return to stove and simmer until thickened. Last, add heavy cream and, if desired, sherry wine.

(Women's News Service)

Anthropogenic Impacts on Kiawah Terrapins



Habitat Loss and Degradation

Road Mortality



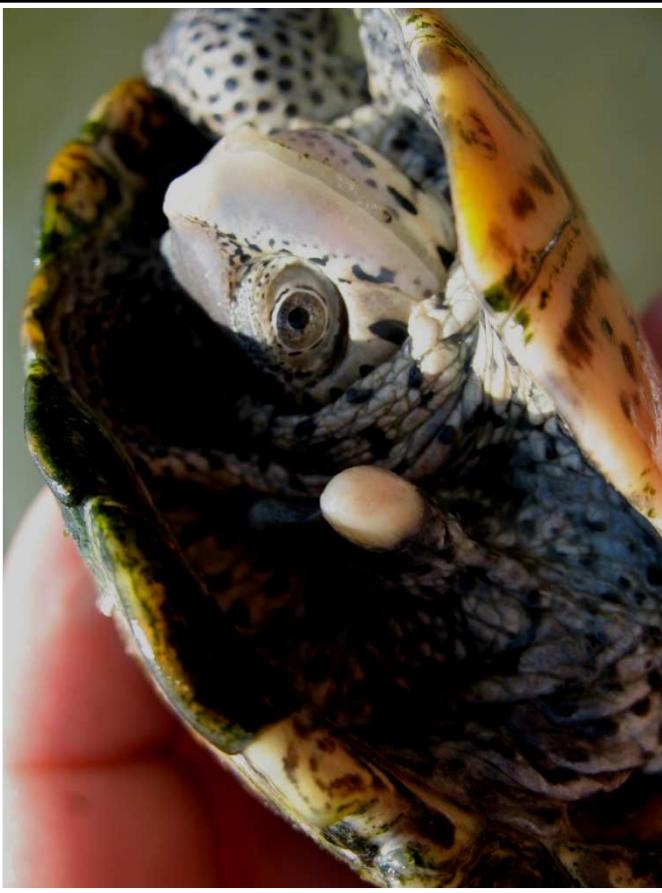
Anthropogenic Impacts on Kiawah Terrapins



Crab Traps

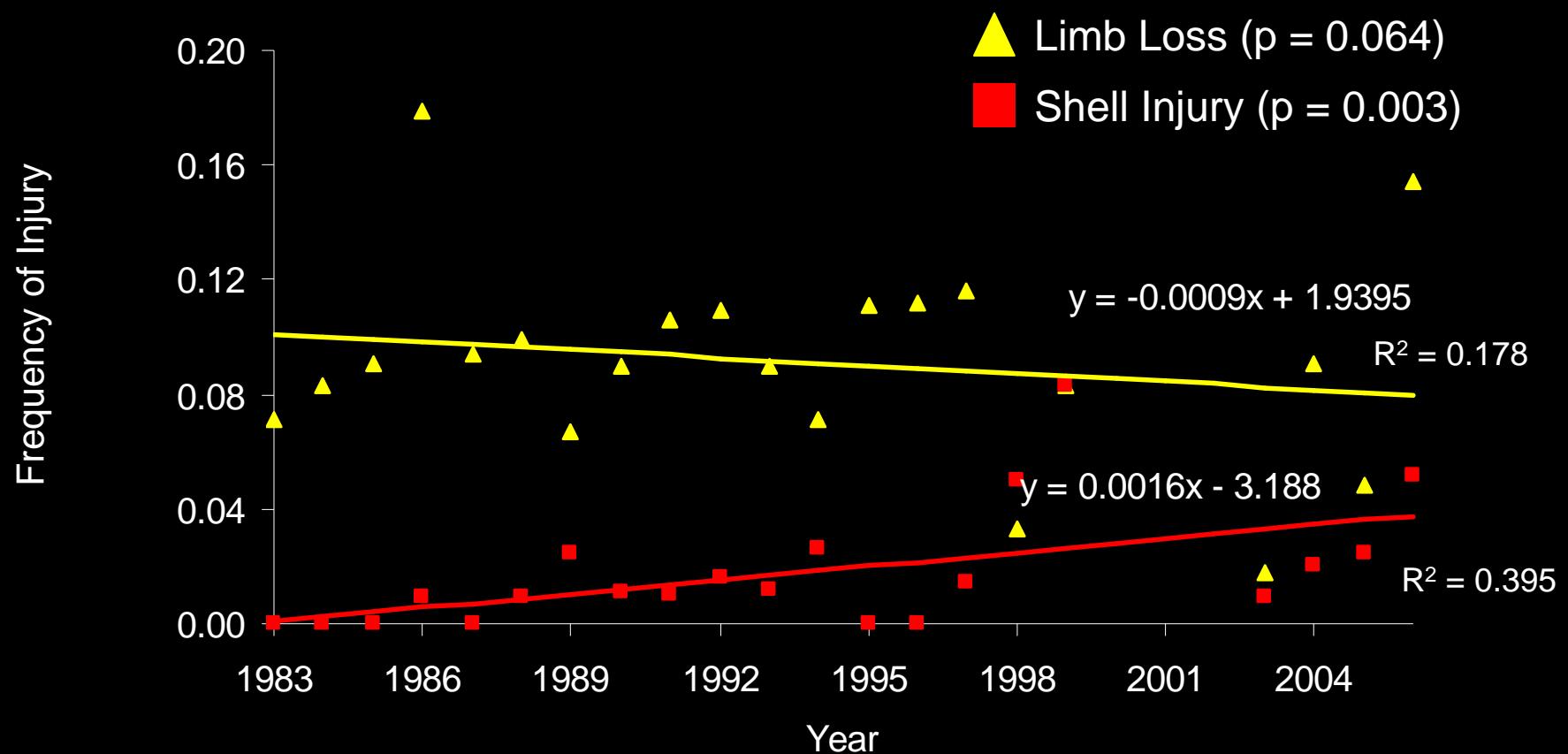




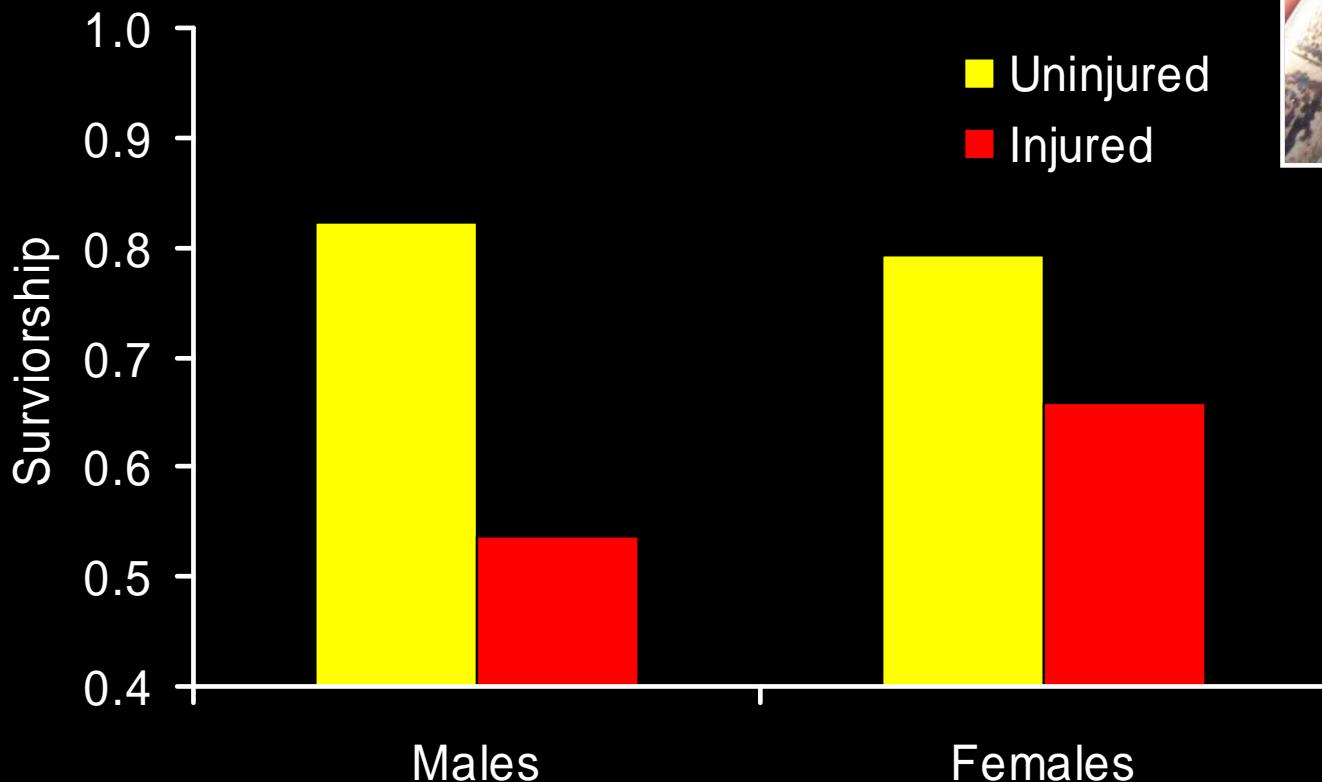




Results



Results



Program MARK –
 $\Phi(\text{group}, \text{time})p(\text{time})$ for males and
females separately.
(White and Burnham 1999)

Conclusions

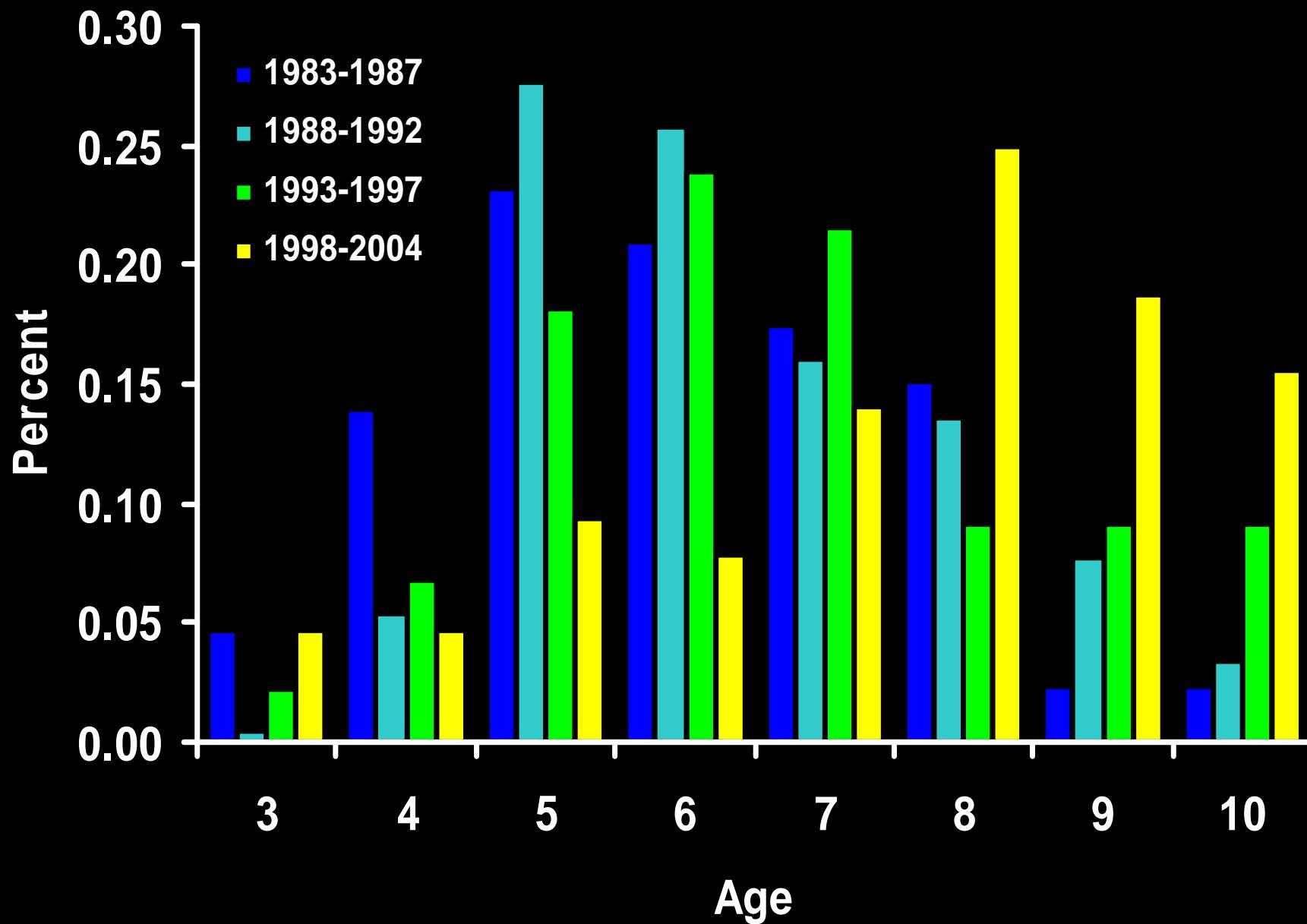
- Limb loss a result of aquatic predators



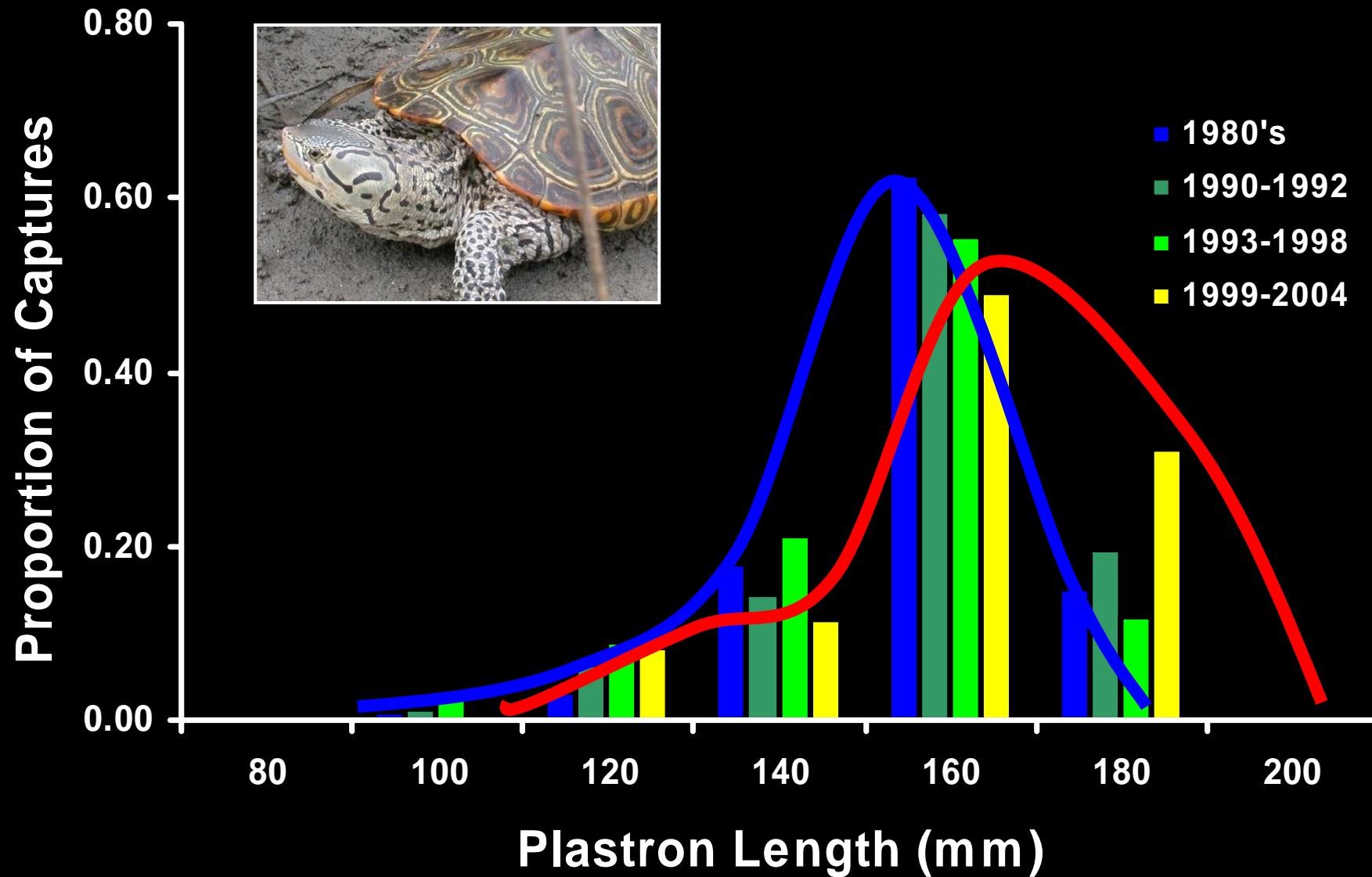
Boat Traffic



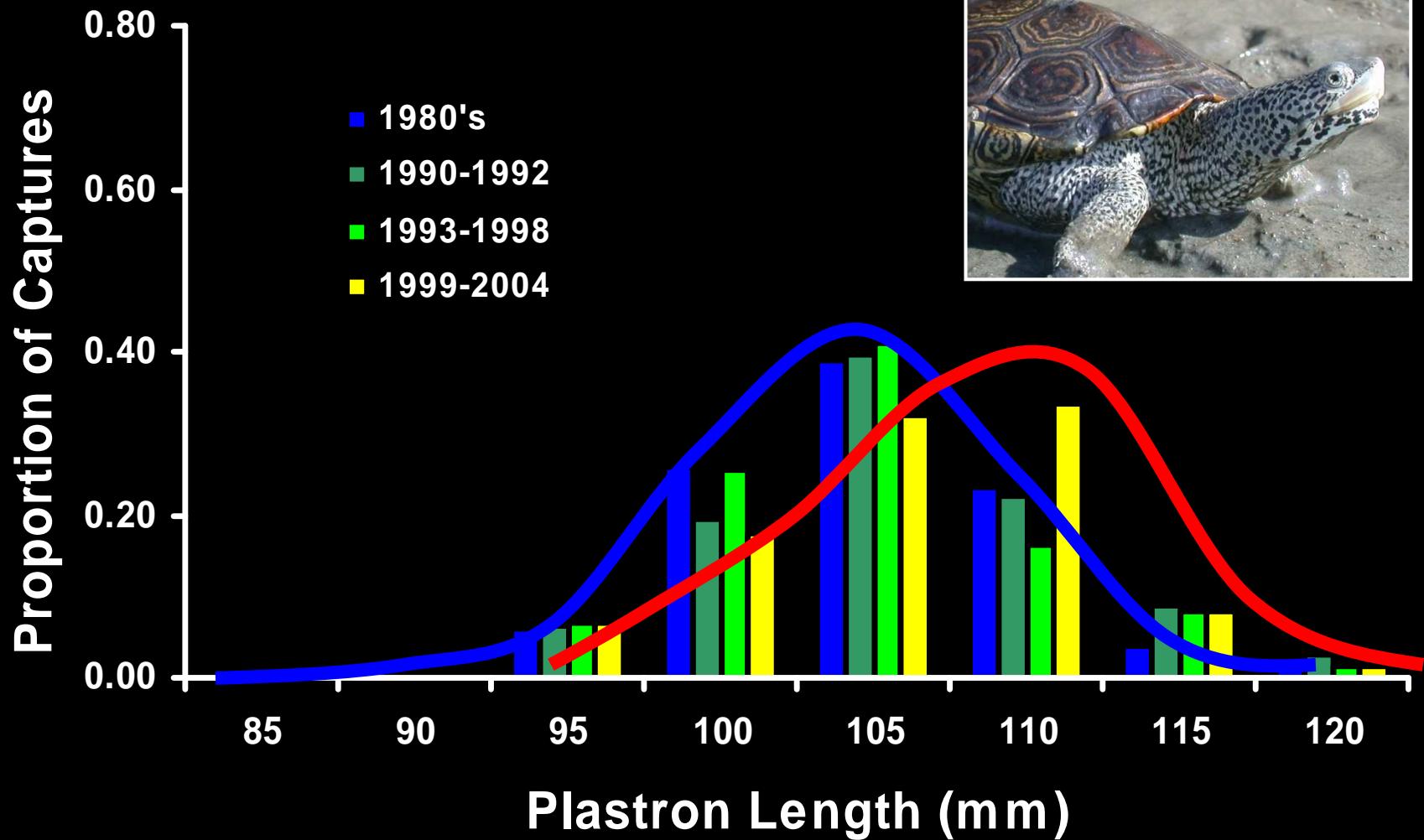
Changes in Age Structure Over Time



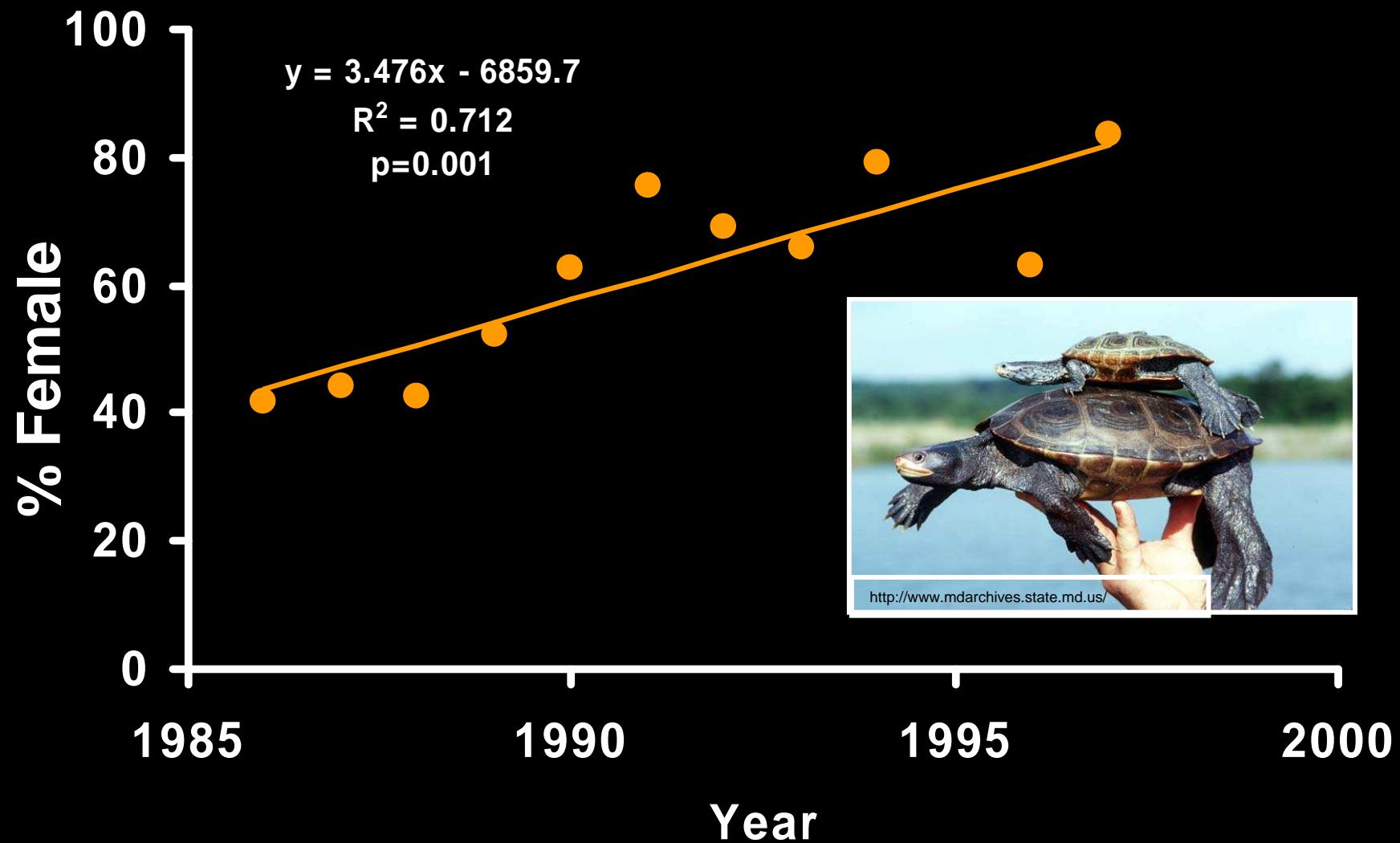
Changes in Size Over Time - Females



Changes in Size Over Time – Males



Changes in Sex Ratio Over Time







A.M. Grosse
unpubl. data

Conclusions

- Increased boat traffic results in increased shell damage – reduces survivorship.
- Major factor – crab trapping



What's Needed?

Range-wide Information



Carolina Herp Atlas

- Operated by
Davidson College
Herpetology Lab
- Supported by:
NCWRC
SCDNR

6461 records
128 species
318 users
Since March 2007

The screenshot shows the homepage of the Carolina Herp Atlas. At the top, there's a navigation bar with links for Home, My Herps, Data and Maps, Photos, and About Us. The main content area features a large image of a snake (likely a water moccin) coiled up. Below the image, the "Project Overview" section contains text about the project's purpose and objectives, followed by a numbered list of benefits for users. Further down, there's information on how to submit records, a call for observations, and a contact link. A sidebar on the right provides "Atlas Status" statistics (Records: 6461, Species: 128, Photos: 557, Users: 318), links to herp records for North and South Carolina, and logos for the Davidson Herpetology group and the Davidson Instructional Technology Group. Another sidebar lists partners like the Savannah River Ecology Laboratory and the Partners in Amphibian and Reptile Conservation, along with support from the NC Parks and Wildlife Resources Commission.

My Herps

Carolina Herp Atlas

Welcome
[Submit Record](#) | [Login](#) | [Register](#)

[Home](#) **My Herps** [Data and Maps](#) [Photos](#) [About Us](#)



The 'My Herps' section of the Carolina Herp Atlas enables you to add records to the atlas and keep track of your reptile and amphibian observations and their geographic location.

After registering and logging into the atlas, you can start entering your species observations. Each observation should include: 1) state and county, 2) genus and species, 4) date, 5) location, 6) geographic coordinates (using our GeoLocator) 7) remarks, 8) and a photo for verification of the species identification.

Log In

User Name:

Password:

Remember me next time.

Atlas Status

Records: 5291
Species: 113
Photos: 559
Users: 216

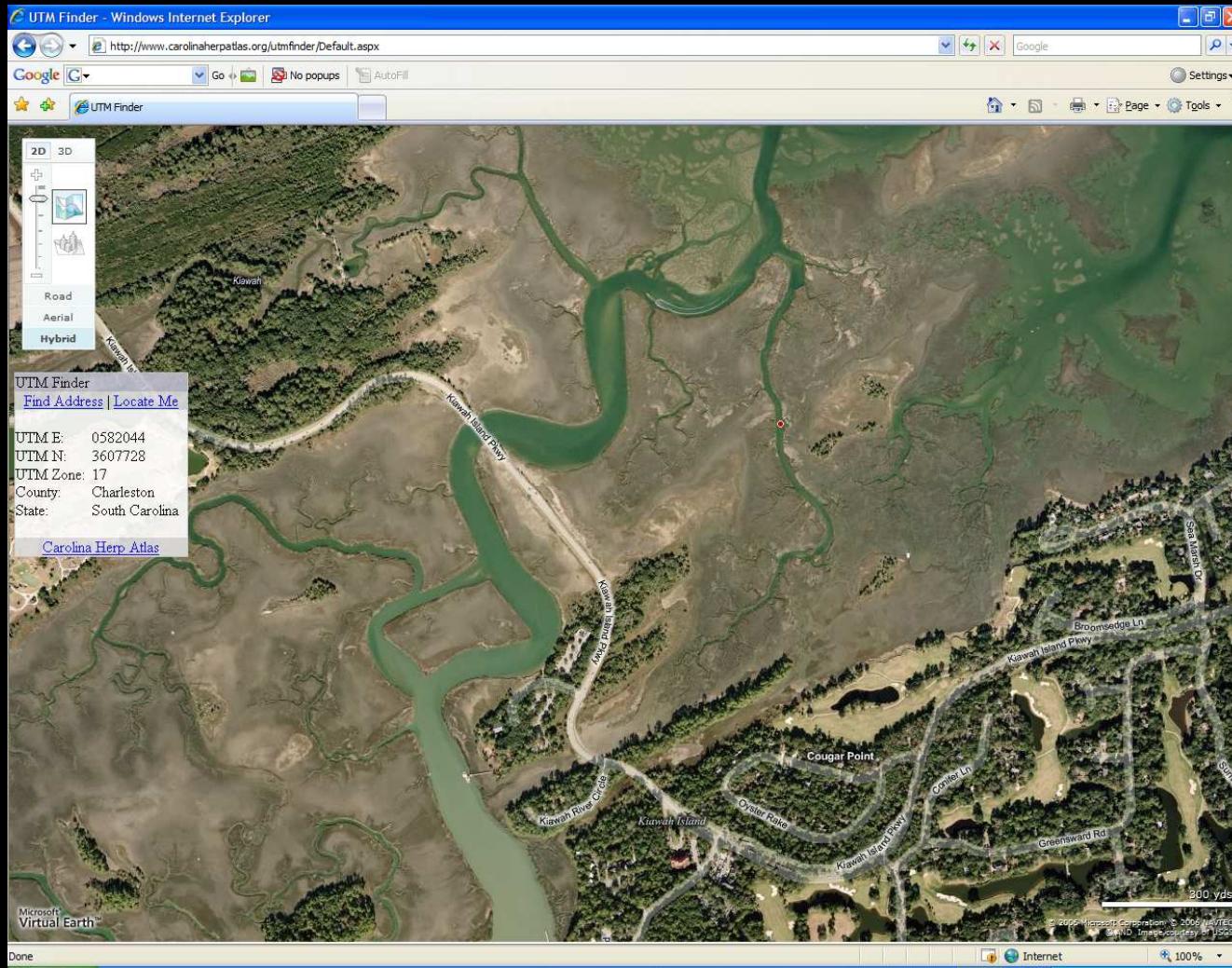
Links

[Herps of North Carolina](#)
[Herps of South Carolina](#)

Created and Operated by



Geolocator – pinpointing your observation



www.carolinaherpatlas.org

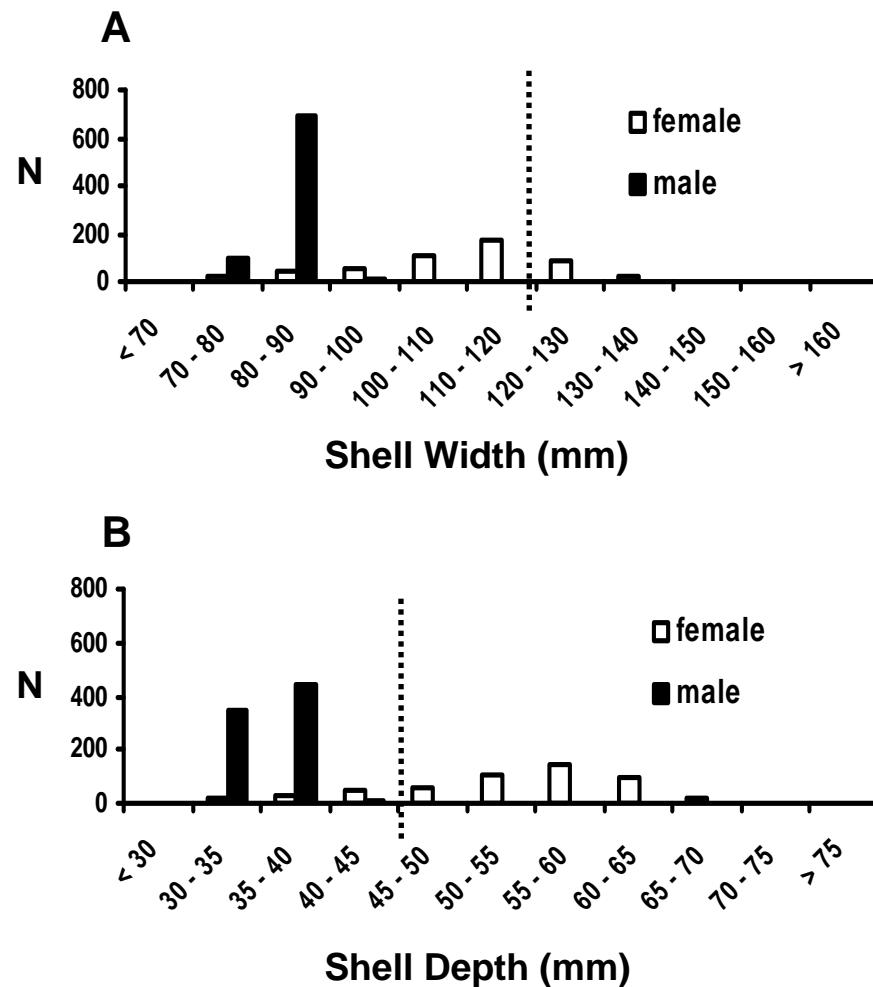
What's Needed?

Ghost Trap Removal



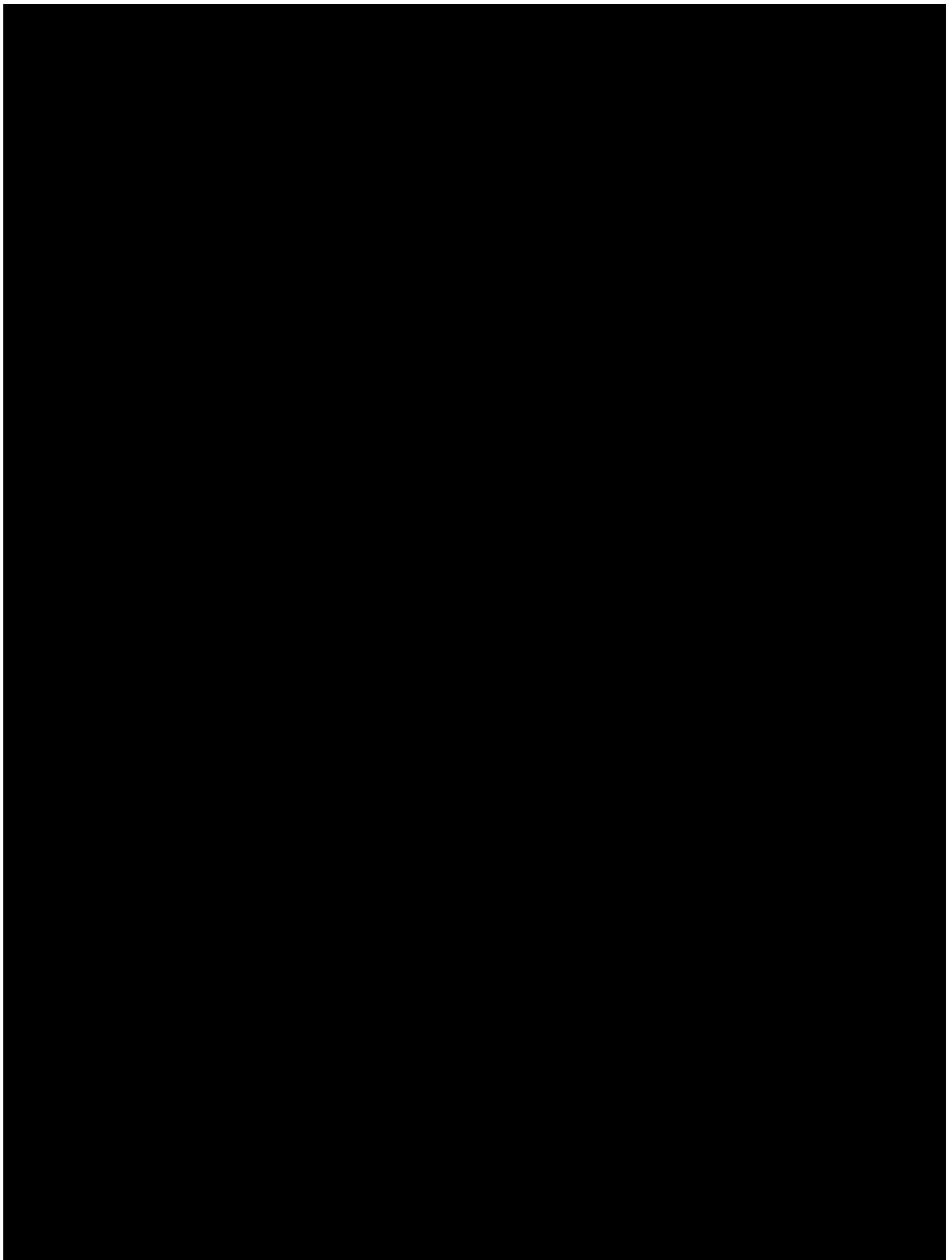
Bycatch Reduction Devices

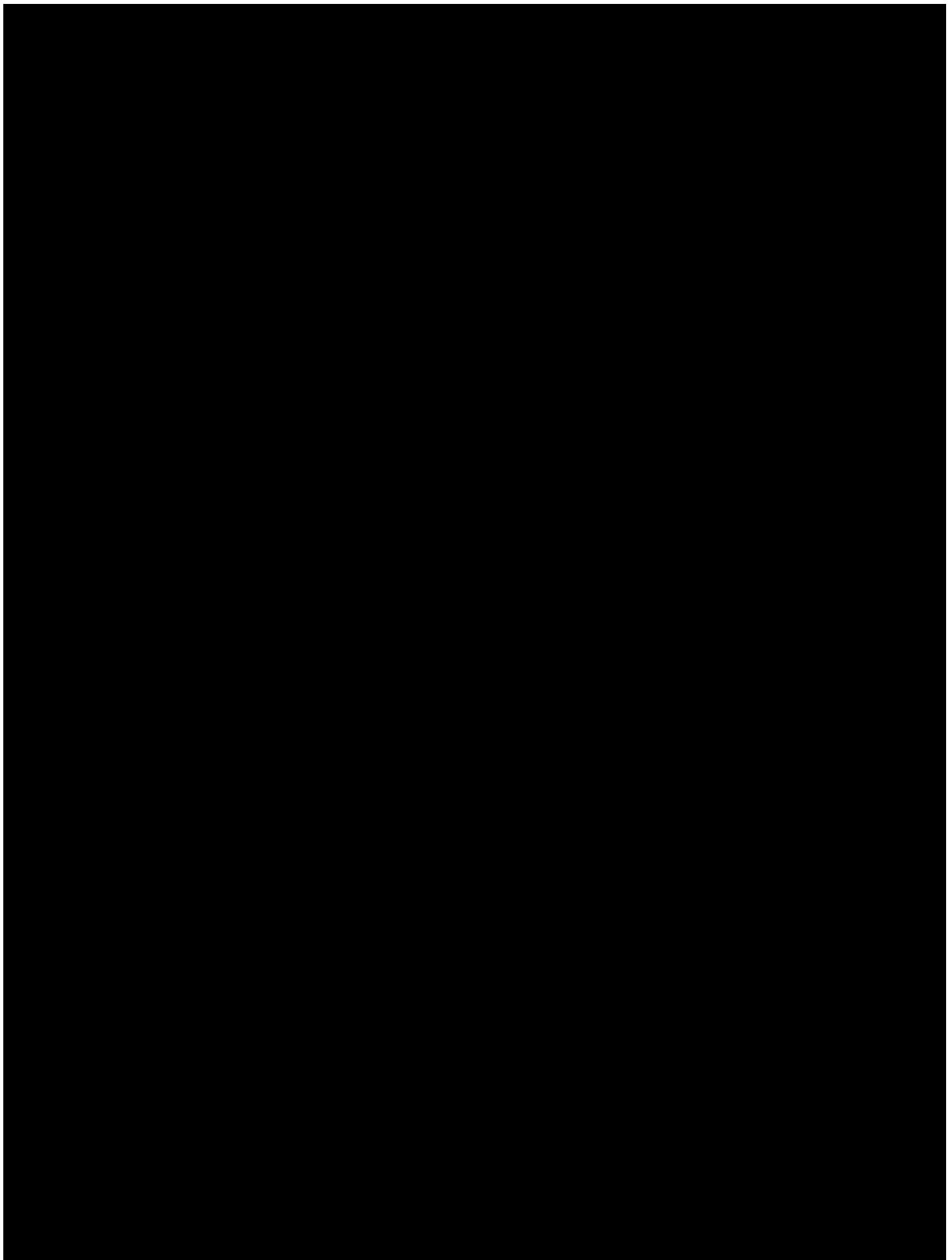
Bycatch-Reduction Devices at Kiawah Island





No
Crabbing



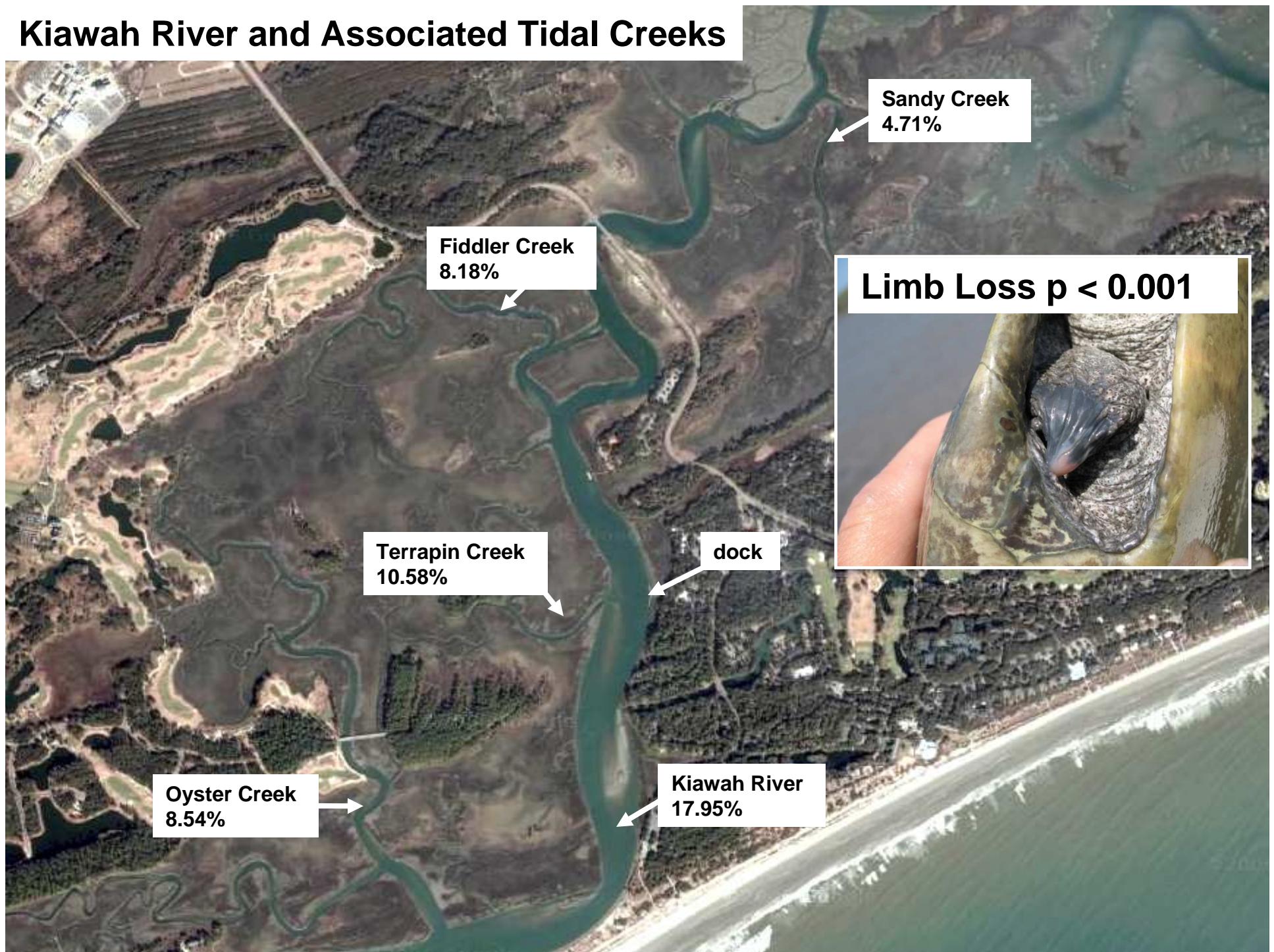


Hypotheses

- If anthropogenic, we hypothesize that...
 - Females will have higher rates of limb loss.
 - Rates of injury will increase over time.
- Investigate spatial distribution of injuries.
- Determine the effects of injury on survivorship.



Kiawah River and Associated Tidal Creeks



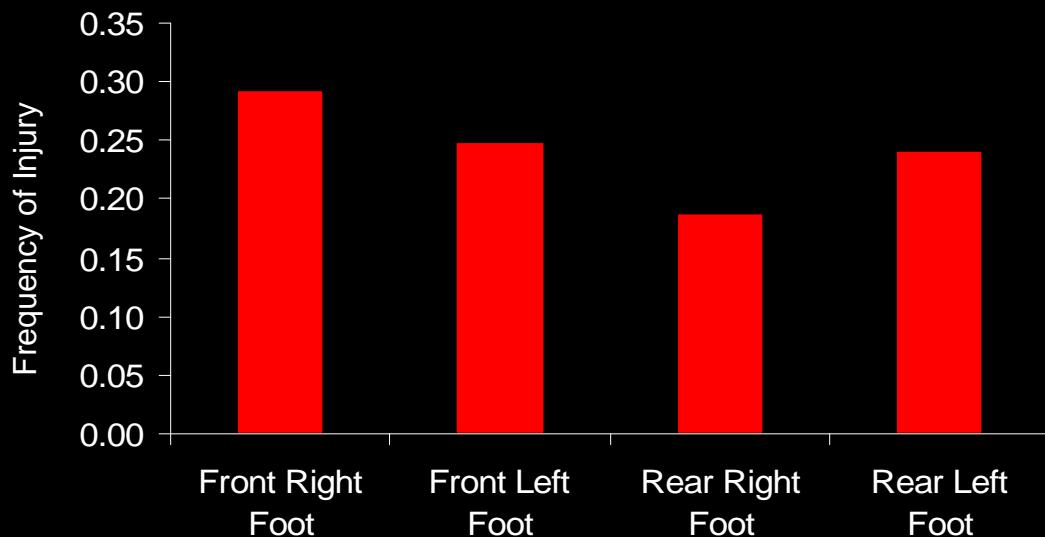


Program MARK CJS results

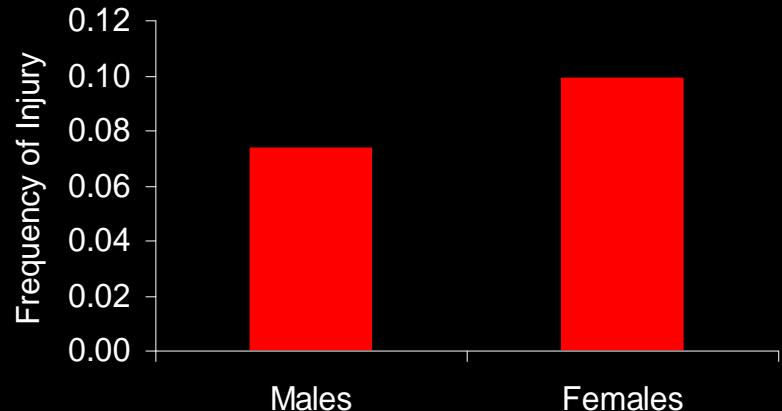
Model	# Parameters	QAIC	QAICc w
Males			
$\phi(\text{group}, \text{time})p(\text{time})$	17	1541.83	0.99457
$\phi(\text{constant})p(\text{time})$	16	1552.25	0.00542
$\phi(\text{time})p(\text{time})$	29	1570.55	0.00000
Females			
$\phi(\text{group}, \text{time})p(\text{time})$	18	741.91	0.57543
$\phi(\text{constant})p(\text{time})$	17	742.52	0.42456
$\phi(\text{time})p(\text{time})$	31	765.9	0.00000

Results

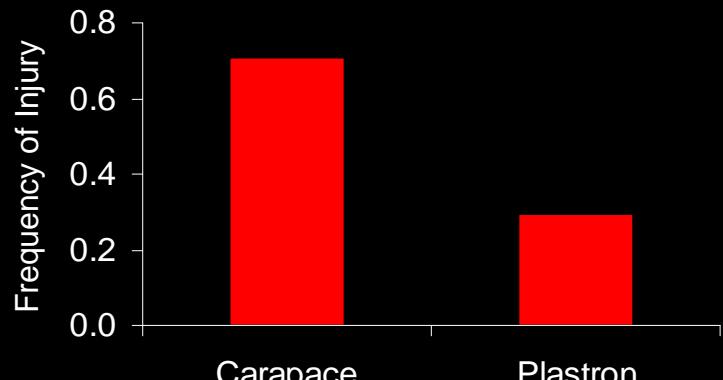
- 10.83% had a major injury.
- 8.06% were missing a limb.
 - 0.97% were missing multiple limbs.
- 2.78% had major shell damage.



Limb loss frequency did not vary among limbs ($p = 0.385$).



Males and females have similar frequencies of major injuries ($p = 0.553$).



The carapace was injured more frequently.

Results

